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NOTICE OF ALLOWANCE AND FEE(S) DUE

22879 7590 03/24/2008

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER

DENG, ANNA CHEN

ART UNIT

PAPER NUMBER

2191

DATE MAILED: 03/24/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,967	02/18/2004	Darren John Cepulis	200314546-1	1689
TITLE OF INVENTION: ROM-EMBEDDED DEBUGGING OF COMPUTER				

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	06/24/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

22879 7590 03/24/2008

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Darren John Cepulis

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TITLE OF INVENTION: ROM-EMBEDDED DEBUGGING OF COMPUTER

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nonprovisional	NO	\$1440	\$300	\$0	\$1740	06/24/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
DENG, ANNA CHEN	2191	717-128000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 744 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 744 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/780,967

Examiner

ANNA DENG

Applicant(s)

CEPULIS, DARREN JOHN

Art Unit

2191

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 12/14/2007.
2. ☒ The allowed claim(s) is/are 1-4, 7-13, 16-19, 21-26 and 28-33.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

1. This action is in response to amendment filed on 12/14/2007.
2. The rejection under 35 U.S.C. 102 (e) as being anticipated by Corti et al. (US 6,834,360 B2) to claims 1-5, 7-13, 15-26, and 28-33 is withdrawn in view of applicant's amendment.
3. The rejection under 35 U.S.C. 103 (a) as being unpatentable over Corti et al. (US 6,834,360 B2), in view of Case et al. (US 6,694,489 B1) to claims 6, 14, and 27 is withdrawn in view of applicant's amendment.
4. Claims 1, 11, 17, 19, 22, 24, 29-30, and 33 are amended (see Examiner's Amendment below).
5. Claims 5-6, 14-15, 20, and 27 are cancelled (see Examiner's Amendment below).
6. Claims 1-4, 7-13, 16-19, 21-26, and 28-33 are pending.
7. Claims 1-4, 7-13, 16-19, 21-26, and 28-33 are allowed.

EXAMINER'S AMENDMENT

8. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jon Lindsay (Reg. No. 36,855) on 3/13/2008 to place the claimed subject matters in the condition for allowance.

The application has been amended as follows:

In the Claims:

Claims 5-6, 14-15, 20, and 27 are canceled.

Claims 1, 11, 17, 19, 22, 24, 29-30, and 33 are amended as follows:

Claim 1 (Currently Amended):

Replace Claim 1 to:

-- A method for debugging a computer system, comprising:

initiating a process in the computer system, the process including instructions and running on a general-purpose processor in the computer system;

launching a debugger program that is embedded in a ROM of the computer system, the debugger program running on the general-purpose processor;

executing at least part of the instructions by the general-purpose processor;

interrupting execution of the instructions by stopping the execution of the instructions at a first break point in order for the debugger program to operate on at least part of the executed instructions;

the debugger program disassembling a current instruction of the instructions;

determining a length of the current instruction, the length of the current instruction indicating a start point for a next instruction of the instructions;

the debugger program setting a second break point in the instructions at the start point of the next instruction; and

continuing the execution of the instructions. --

Claim 11 (Currently Amended):

Replace Claim 11 to:

-- A computer system, comprising:

at least one general-purpose processor;

a read-only memory (ROM) connected to the general-purpose processor;

a target process having instructions, executable by the general-purpose processor; and

a debugger program embedded within the ROM, executable by the general-purpose processor, to interrupt execution of the instructions by stopping the execution of the instructions at a first break point in order for the debugger program to operate on at least part of the instructions of the target process;

and wherein:

the debugger program disassembles a current instruction of the instructions; determines a length of the current instruction, the length of the current instruction indicating a start point for a next instruction

Art Unit: 2191

of the instructions; sets a second break point in the instructions at the start point of the next instruction;
and

the execution of the instructions continues. --

Claim 17 (Currently Amended):

Replace Claim 17 to:

-- A computer system as defined in claim 11, further comprising:
an interrupt flag that when set causes an interruption of execution of the target process;
and wherein, upon interruption of the execution of the target process, the debugger program
operates on the current instruction of the target process. --

Claim 19 (Currently Amended):

Replace Claim 19 to:

-- A computer debugging system, comprising:
a target computer;
a monitoring system connected to the target computer;
a data storage device in the monitoring system;
a read-only memory (ROM) in the target computer;
a general-purpose processor in the target computer;
a target process having instructions executable by the general-purpose processor in the target
computer; and
a debugger program embedded in the ROM and executable by the general-purpose processor in
the target computer to interrupt execution of the instructions by stopping the execution of the instructions
at a first break point in order to generate data on the execution of at least part of the instructions of the
target process and to transfer the data to the monitoring system for recording in the data storage device;
and wherein:

the debugger program disassembles a current instruction of the instructions; determines a length of the current instruction, the length of the current instruction indicating a start point for a next instruction of the instructions; sets a second break point in the instructions at the start point of the next instruction; and

the execution of the instructions continues. --

Claim 22 (Currently Amended):

Replace Claim 22 to:

-- A computer system, comprising:

a read-only memory (ROM) means for storing computer control instructions;

a general-purpose means for executing a target process;

a ROM-embedded means for interrupting the execution of the target process at a current instruction by stopping the execution of the instructions at a first break point, the interrupting means being executable by the target process executing means;

a ROM-embedded means for disassembling the current instruction, determining a length of the current instruction, the length of the current instruction indicating a start point for a next instruction of the instructions, and setting a second break point in the instructions at the start point of the next instruction, the disassembling means being executable by the target process executing means;

a means for executing the current instruction; and

a ROM-embedded means for capturing a trace of the current instruction and of results of the execution of the current instruction, the trace capturing means being executable by the target process executing means. --

Claim 24 (Currently Amended):

Replace Claim 24 to:

-- A computer system comprising:

Art Unit: 2191

a general-purpose processor;

a read-only memory (ROM);

a target process having executable instructions that are executable by the general-purpose processor; and

a debugger program embedded within the ROM and having a disassembler and a trace capturer that are executable by the general-purpose processor;

and wherein:

the debugger program interrupts execution of the target process at some of the instructions, by stopping the execution of the instructions at a first break point;

the disassembler disassembles at least some of the instructions at which the execution of the target process is interrupted;

the debugger program determines a length of the current instruction, the length of the current instruction indicating a start point for a next instruction of the instruction, and sets a second break point in the instructions at the start point of the next instruction;

the trace capturer captures a trace of at least some of the disassembled instructions; and

the execution of the instructions continues. --

Claim 29 (Currently Amended):

Replace Claim 29 to:

-- A computer system comprising:

a switch;

a general-purpose processor;

a target process having executable instructions that are executable by the general purpose processor; and

a debugger program that is executable by the general-purpose processor;

and wherein:

when the switch is off, the debugger program cannot be launched in the general-purpose processor;

when the switch is on, the debugger program can be launched in the general-purpose processor to interrupt execution of the target process in the general-purpose processor at some of the instructions by stopping the execution of the instructions at a first break point and to operate on at least some of the instructions at which the execution of the target process is interrupted by disassembling a current instruction of the instructions; determining a length of the current instruction, the length of the current instruction indicating a start point for a next instruction of the instructions; and setting a second break point in the instructions at the start point of the next instruction; and

the execution of the instructions continues. --

Claim 30 (Currently Amended):

Replace Claim 30 to:

-- A method for debugging a target process executing on a computer system, comprising:

launching, in a general-purpose processor of the computer system, a debugger program from a read-only memory (ROM) of the computer system, the ROM having a boot process and the debugger program embedded therein, the debugger program having a disassembler and a trace capturer;

interrupting execution, in the general-purpose processor, of the target process at a current instruction by stopping the execution of the instructions at a first break point;

the disassembler disassembling, in the general-purpose processor, the current instruction;

determining a length of the current instruction, the length of the current instruction indicating a start point for a next instruction of the instructions;

the debugger program setting a second break point in the instructions at the start point of the next instruction;

continuing the execution of the instructions; and

the trace capturer capturing a trace, in the general-purpose processor, of the current instruction.--

Claim 33 (Currently Amended):

Replace Claim 33 to:

-- A method for debugging a target process executing on a computer system, comprising:
setting a switch within the computer system to one of an on state and an off state;
when the switch is set to the off state, preventing execution of a debugger program in a general-purpose processor of the computer system; and
when the switch is set to the on state:
launching the debugger program in the general-purpose processor;
interrupting, in the general-purpose processor, execution of the target process at a current instruction by stopping the execution of the instructions at a first break point; and
the debugger program operating, in the general-purpose processor, on the current instruction by disassembling a current instruction of the instructions; determining a length of the current instruction, the length of the current instruction indicating a start point for a next instruction of the instructions; and setting a second break point in the instructions at the start point of the next instruction; and
continuing the execution of the instructions. --

--END--

REASONS FOR ALLOWANCE

9. The following is an examiner's statement of reasons for allowance:

The cited prior art taken alone or in combination fail to teach, in combination with the other claimed limitations, interrupting execution of the instructions by stopping the execution of the instructions at a first break point in order for the debugger program to operate on at least part of the executed instructions; the debugger program disassembling a current instruction of instructions; determining a length of the current instruction, the length of the current instruction indicating a start point for a next

Art Unit: 2191

instruction of the instructions; the debugger program setting a second break point in the instructions at the start point of the next instruction; and continuing the execution of the instructions as recite in all the independent claims 1, 1, 11, 19, 22, 24, 29, 30 and 33.

The closes cited prior arts, the combination of Corti et al. (US 6,834,360 B2), and Case et al. (US 6,694,489 B1) teaches a method for debugging a computer system. However, the combination of Corti et al. (US 6,834,360 B2), and Case et al. (US 6,694,489 B1) fails to teach interrupting execution of the instructions by stopping the execution of the instructions at a first break point in order for the debugger program to operate on at least part of the executed instructions; the debugger program disassembling a current instruction of instructions; determining a length of the current instruction, the length of the current instruction indicating a start point for a next instruction of the instructions; the debugger program setting a second break point in the instructions at the start point of the next instruction; and continuing the execution of the instructions as recite in all the independent claims 1, 1, 11, 19, 22, 24, 29, 30 and 33, also as application pointed out in the applicant's remarks in page 13.

These claimed limitations are not present in the prior art of record and would not have been obvious, thus all pending claims 1-4, 7-12, 16-19, 21-26, and 28-33 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna Deng whose telephone number is 571-272-5989. The examiner can normally be reached on Mondays to Fridays 9:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Zhen can be reached on 571-272-3708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2191

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Anna Deng/

Examiner, Art Unit 2191

3/13/2008

/Wei Zhen/

Supervisory Patent Examiner, Art Unit 2191